



GRAFACON

MODEL 1010

The GRAFACON* MODEL 1010 is a two-dimensional, digital graphic input system for general purpose computers. The system comprises a "writing" surface, stylus and associated control electronics. It permits greater freedom of expression in direct man-machine communication than heretofore possible.

The unique printed-circuit screen, with printed circuit capacitive-coupled encoding, is the heart of the graphic input system. The writing surface is a 10 x 10 inch area, with 100 lines per inch resolution in both x and y. It accommodates 10^6 input locations, with excellent linearity. A computer-controlled scanning system to locate and track the stylus is not required.

The stylus contains a pick-up probe, amplifier and a control-signal switch which is actuated by pressure on the stylus tip. System control electronics is completely solid state, and is contained in 7 inches of panel space for standard 19" rack mounting.

The GRAFACON MODEL 1010 is the first all digital input system available for general man-machine communication. The system finds application in a wide range of fields now utilizing digital computers extensively as a means of research, production data processing, and graphical data reduction.

*TM Data Equipment Co.

DATA EQUIPMENT COMPANY

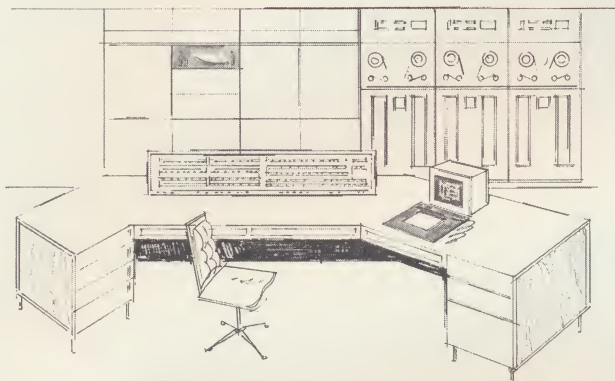


GRAFACON MODEL 1010 APPLICATIONS

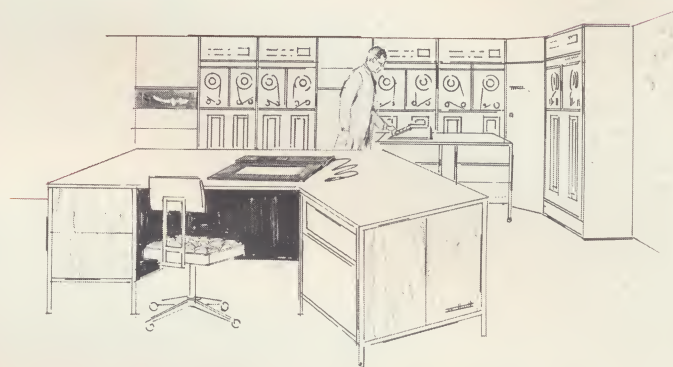
Digital computer input device for application of graphical languages, automated design and planning functions.

For the digitizing of:

- X-Y and strip chart recordings
- Meteorological and hydrographic charts and maps
- Handwriting
- Aerial photographs



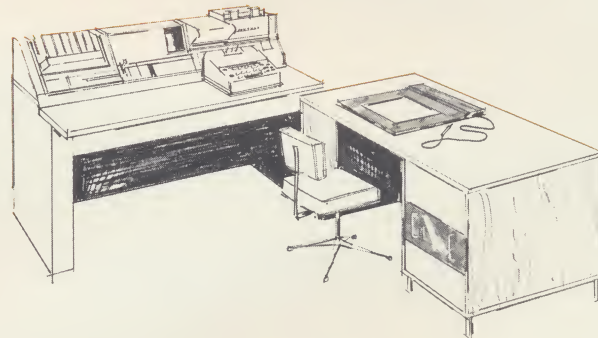
On-Line . . . GRAFACON with Digital Computer



Off-Line . . . GRAFACON/Magnetic Tape System



Off-Line . . . GRAFACON/Paper Tape System



Off-Line . . . GRAFACON/Punched Card System

GRAFACON MODEL 1010 SYSTEM DESCRIPTION

Description of the GRAFACON MODEL 1010 is illustrated by reference to the general system block diagram. Information flow paths are indicated by the heavier lines. The Clock Sequencer furnishes a time sequence of 20 pulses to the blocking oscillators, during which they give coincident positive and negative pulses on two lines attached to the tablet.

The pulses are encoded by the tablet as serial x, y Gray-code position information which is sensed by the high-input-impedance, pen-like

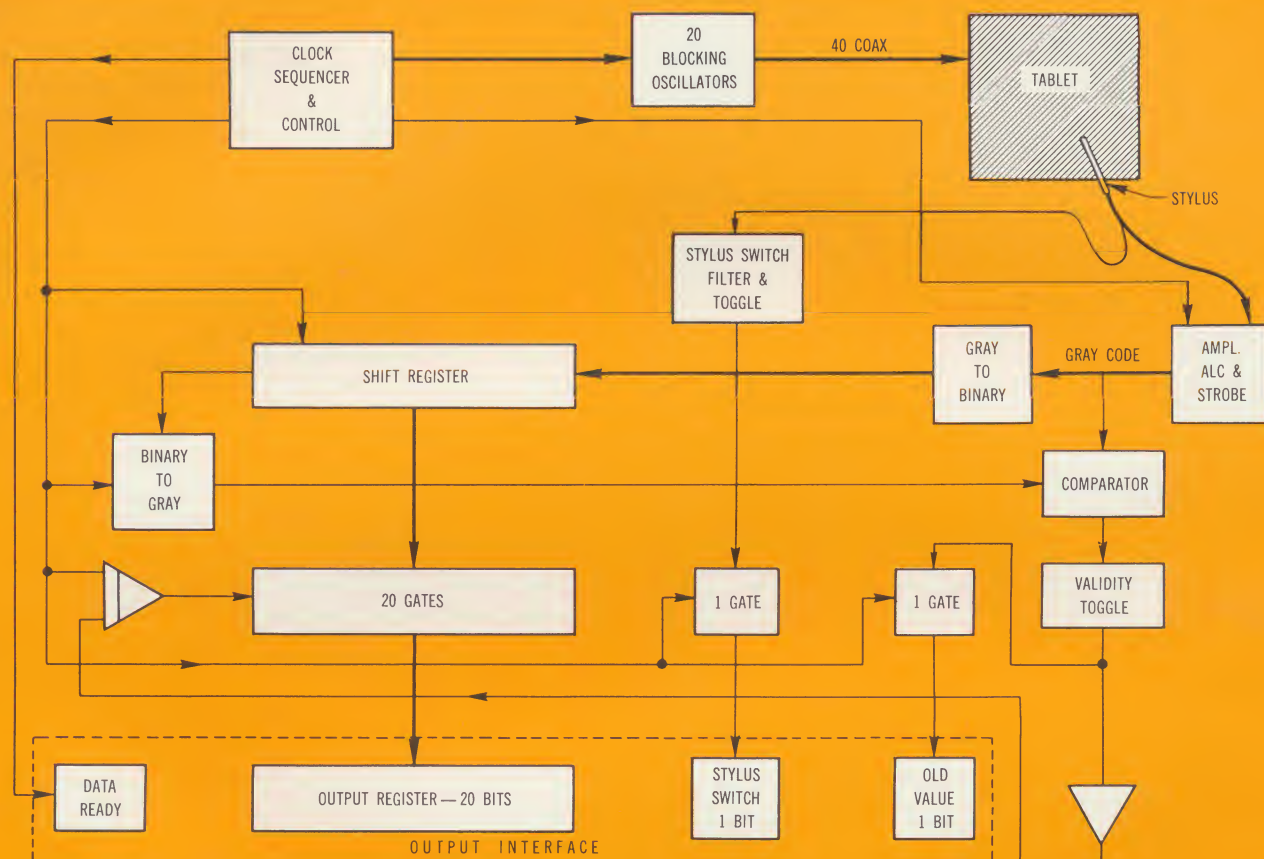
stylus from the epoxy-coated tablet surface. This information is strobed, converted from Gray to binary code, assembled in a shift register, and gated in parallel to an interface register.

The Gray code was selected so that only one bit would change value with each wire position, giving a complete and unambiguous determination of the stylus position. Further, Gray code facilitates serial conversion to binary.

The top circuit contains the x position lines and y encoder sections, while the bottom circuit has the y position lines and x encoder sections. Position lines are connected at the ends to wide, code-coupling buses; these buses are as wide as possible in order to obtain the maximum area, since the encoding method depends on capacitive

A pen-like stylus of high input impedance placed anywhere on the tablet will pick up a time sequence of pulses, indicating the x, y position of the stylus. This detected pulse pattern will repeat itself every major cycle as long as the stylus is held in this position.

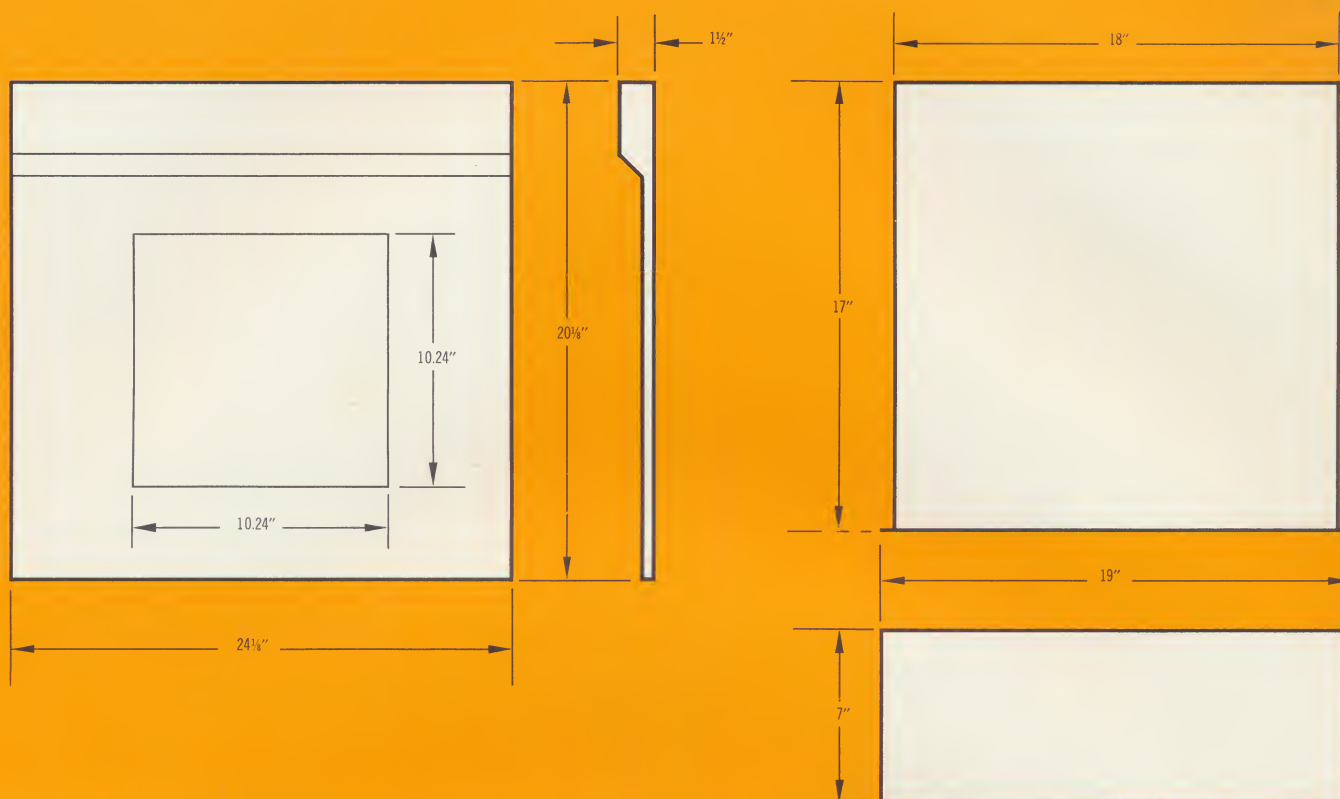
As the stylus is moved, a different pulse pattern is sensed, indicating a new position. Since there are 1024 x position lines and 1024 y position lines, 20 bits are required to define a point.



As an x, y value is being converted to binary and shifted into one end of the shift register, the old

The logic and clock systems are made up principally with NOR circuits and univibrators. Transformer coupling ensures well-matched positive and negative pulses to obtain proper cancellation at the tablet surface.

DIMENSIONS



GRAFACON MODEL 1010 SPECIFICATIONS

ALL SOLID STATE CIRCUITRY

DATA RATE

4,500 points (X, Y) per second; 220 μ sec. timing cycle duration

RESOLUTION

100 Lines per inch

OUTPUT INTERFACE DATA

OUTPUT REGISTER

Two, 10-bit, x and y

TOGGLE LEVELS

-2v. to 0v = True or 1

-4v to -6v = False or 0

DATA READY TOGGLE

Set true 14 μ sec. after completion of interrogation pulses; remains true 188 μ sec.

STYLUS

Toggle reset (0) after pulse train from tablet; goes true (1) 9 μ sec. later if switch is still actuated.

OLD VALUE TOGGLE

Validity toggle is set if the output register number differs by more than one bit from incoming value. If data held is invalid, register is left with previous value and old value toggle is set.

ELECTRICAL INTERCONNECTIONS

The toggle outputs (binary value and its complement) from the X and Y registers are made available through AMP 201299-1 connectors. Control signal toggle outputs are available through an Amphenol 57-40140. Both connectors are located at the rear of the electronic package. The connecting cables should be fabricated with RG/174 coax and may be up to twelve (12) feet in length.

TABLET CONNECTION TO ELECTRONICS

A twelve (12) foot cable fabricated with RG/174 coax is furnished.

ENVIRONMENT

Temperature range 0° to 50°C, relative humidity 85%.

POWER

105v to 125v, 50/60 cps., 40w.

DIMENSIONS

Tablet: Writing area - 10.24" x 10.24".

Overall - 20 1/8" x 24 1/8" x 1 1/2"

Electronics: 7" x 18" x 19".

WEIGHT

Tablet: 7 pounds.

Electronics: 35 pounds.

Price: Model 1010 - \$9,600.00 F.O.B. Santa Ana, Calif.; Terms, Net 30 days.

Prices and specifications subject to change without notice.

ON-LINE/OFF-LINE INTERFACE ELECTRONICS WILL BE QUOTED UPON REQUEST.

The GRAFACON Model 1010 is manufactured under license from the Rand Corporation, Santa Monica, California



DATA EQUIPMENT COMPANY

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